

WHAT IS CLAIMED IS:

1. A cooling unit to cool a heat generating component, comprising:

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5 a heat sink arranged adjacent to said heat generating component;

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10 a heat diffusing member arranged between said heat generating component and said heat sink;

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15 a first heat conducting member interposed between said heat generating component and said heat diffusing member to thermally connect said heat generating component and said heat diffusing member; and

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20 a second heat conducting member interposed between said heat diffusing member and said heat sink to thermally connect said heat diffusing member and said heat sink.

25 2. The cooling unit according to claim 1, wherein said heat sink has area dimensions greater than said heat generating component.

20 3. The cooling unit according to claim 1, wherein said heat diffusing member has a thermal conductivity higher than said second heat conducting member and area dimensions greater than said heat generating component.

25 4. The cooling unit according to claim 1, further including a spring member to urge said heat diffusing member towards said heat generating component.

5. A cooling unit according to claim 1, wherein

said first heat conducting member is less thick-----

than said second heat conducting member, and said second heat conducting member is displaced in a direction of thickness.

6. A cooling unit according to claim 1, wherein
5 said heat generating component has a radiation
19 surface, and said heat diffusing member has a first
thermal contact surface facing said radiation surface
and a second thermal contact surface facing said heat
sink, said first and second thermal contact surfaces
10 each having an area larger than said radiation surface.

C2 23811 7. A cooling unit according to claim 6, wherein
said heat diffusing member is urged toward said
heat generating component by springs.

8. A cooling unit according to claim 1, wherein
15 said heat generating component has a plurality of
corners along an outer periphery, and said heat
diffusing member has a plurality of engaging sections
54 to be engaged with the respective corners, a positional
relationship of said heat generating component and said
20 heat diffusing member being defined by mutual
engagement of said corners and said engaging sections.

9. A cooling unit according to claim 8, wherein
said heat diffusing member has a plurality of
53 tongues to be removably hooked to said heat generating
25 component.

10. A cooling unit according to claim 1, wherein
said first heat conducting member has a thermal

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conductivity higher than said second heat conducting member.

11. A cooling unit according to claim 1, wherein
said heat sink has a heat receiving portion held
in contact with said second heat conducting member, and
a heat exchanging portion thermally connected to said
heat receiving portion and separated from said heat
generating component.

12. A cooling unit according to claim 11, further
including a fan that feeds cooling air to at least said
heat exchanging portion of said heat sink.

13. A cooling unit, comprising:
a semiconductor package having a heat generating
IC chip;

15 a heat sink arranged adjacent to said
semiconductor package, said heat sink having area
dimensions greater than said IC chip;

a heat diffusing member arranged between said
semiconductor package and said heat sink;

20 a first heat conducting member interposed between
said IC chip of said semiconductor package and said
heat diffusing member to thermally connect said IC chip
and said heat diffusing member;

25 a second heat conducting member interposed between
said heat diffusing member and said heat sink to
thermally connect said heat diffusing member and said
heat sink; and

a gap between said IC chip and said heat diffusing member being narrower than a gap between said heat diffusing member and said heat sink, said heat diffusing member having a thermal conductivity higher
5 than said second heat conducting member and area dimensions greater than said IC chip.

14. A cooling unit according to claim 13, wherein
said semiconductor package is mounted on a circuit substrate, and said heat diffusing member and said heat sink are respectively made of electrically conductive
10 materials, said heat diffusing member being electrically connected to said circuit substrate by way of said heat sink.

15. A cooling unit according to claim 14, wherein
said heat diffusing member is pressed against said IC chip by electrically conductive springs interposed between said heat diffusing member and said heat sink, and said heat diffusing member and said heat sink are electrically connected to each other by way of said
20 springs.

16. A cooling unit according to claim 13, wherein
said semiconductor package has a base substrate bearing said IC chip mounted thereon, and said heat diffusing member is rigidly secured to said base
25 substrate.

17. A cooling unit, comprising:

a circuit substrate having a mount surface bearing

a plurality of grounding pads;

an electronic component mounted on said mount surface of said circuit substrate, said electronic component having a heat generating section arranged on a side opposite to said mount surface;

a heat sink arranged adjacent to said electronic component and having area dimensions greater than said heat generating section;

a heat diffusing member arranged between said electronic component and said heat sink and having area dimensions greater than said heat generating section;

a first heat conducting member interposed between said heat generating section of said electronic component and said heat diffusing member to thermally connect said heat generating section and said heat

a second heat conducting member interposed between said heat diffusing member and said heat sink to thermally connect said heat diffusing member and said heat sink; and

a gap between said heat generating section and
said heat diffusing member being narrower than a gap
between said heat diffusing member and said heat sink,
said heat diffusing member being made of an
electrically conductive material having a thermal
conductivity higher than said second heat conducting
member and provided with a plurality of terminal

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sections to be respectively connected to the corresponding grounding pads of said circuit substrate.

18. A cooling unit according to claim 17, wherein said heat sink has a plurality of bosses projecting toward said circuit substrate and rigidly secured to said circuit substrate at positions respectively corresponding to said pads, and said terminal sections of said heat diffusing member are pinched respectively between said corresponding pads and front facets of said corresponding bosses.

10 19. An electronic apparatus, comprising:
 a housing containing a heat generating component;
 a heat sink housed in said housing, said heat sink being arranged adjacent to said heat generating component, said heat sink having area dimensions greater than said heat generating component;
 a heat diffusing member arranged between said heat generating component and said heat sink;
 a first heat conducting member interposed between said heat generating component and said heat diffusing member to thermally connect said heat generating component and said heat diffusing member; and
 a second heat conducting member interposed between said heat diffusing member and said heat sink to thermally connect said heat diffusing member and said heat sink, said heat diffusing member having a thermal conductivity higher than said second heat conducting

member and area dimensions greater than said heat generating component.

20. An electronic apparatus according to claim 19, wherein

5 a gap between said heat generating component and said heat diffusing member is narrower than a gap between said heat diffusing member and said heat sink, and said second heat conducting member is displaceable according to the gap between said heat diffusing member
10 and said heat sink.

21. An electronic apparatus according to claim 19,
13 further including a circuit substrate housed in said housing and bearing said heat generating component.

22. An electronic apparatus according to claim 21,
15 wherein

said heat diffusing member and said heat sink are respectively made of electrically conductive materials, and said heat diffusing member is electrically connected to said circuit substrate by way of said heat sink.
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23. An electronic apparatus according to claim 21,
wherein

said circuit substrate has a plurality of grounding pads, and said heat diffusing member is provided with a plurality of terminal sections to be
25 respectively connected to said grounding pads.

24. A cooling unit to cool a heat generating

component, comprising:

a heat sink arranged adjacent to said heat generating component;

5 a heat diffusing member arranged between said heat generating component and said heat sink;

a first heat conducting member interposed between said heat generating component and said heat diffusing member to thermally connect said heat generating component and said heat diffusing member; and

10 a second heat conducting member interposed between said heat diffusing member and said heat sink to thermally connect said heat diffusing member and said heat sink, wherein said heat sink has area dimensions greater than said heat diffusing member, and said heat diffusion member has area dimensions greater than said heat generating component.

25. The cooling unit according to claim 24,
further including a spring member to urge said heat diffusing member towards said heat generating component.

26. A cooling unit to cool a heat generating component, comprising:

a heat sink arranged adjacent to said heat generating component;

25 a base substrate upon which said heat generating component is affixed, said base substrate having four corners;

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a heat diffusing member arranged between said heat generating component and said heat sink, said heat diffusing member having four engaging sections 56 corresponding to the four corners of said base substrate to allow said base substrate to fit with said heat diffusing member.

10 a first heat conducting member interposed between said heat generating component and said heat diffusing member to thermally connect said heat generating component and said heat diffusing member; and

15 a second heat conducting member interposed between said heat diffusing member and said heat sink to thermally connect said heat diffusing member and said heat sink.

20 27. The cooling unit according to claim 26,
further including a spring member to urge said heat diffusing member towards said heat generating component.

25 28. The cooling unit according to claim 26,
wherein said heat sink has area dimensions greater than said heat diffusing member, and said heat diffusion member has area dimensions greater than said heat generating component.

29. A method of assembling a semiconductor package
25 with a heat diffusing member, comprising:

providing a base substrate upon which a heat generating component is affixed to form said

semiconductor package, said base substrate having four corners;

providing a heat diffusing member to be arranged between said heat generating component and a heat sink,
5 said heat diffusing member having four engaging sections corresponding to the four corners of said base substrate to allow said base substrate to fit with said heat diffusing member;

10 interposing a first heat conducting member between said heat generating component and said heat diffusing member to thermally connect said heat generating component and said heat diffusing member;

15 fitting the four engaging sections of said heat diffusing member to the four corners of said base substrate; and

interposing a second heat conducting member between said heat diffusing member and said heat sink to thermally connect said heat diffusing member and said heat sink.

20 30. The method according to claim 29, further including providing a spring member to urge said heat diffusing member towards said heat generating component.

25 31. A heat diffusing member, comprising:
a diffusion plate having a first thermal contact surface to engage a heat generating component and a second thermal contact surface to engage a heat sink;

and

a pair of lateral plates at opposite ends of said diffusion plate, said lateral plates extending perpendicularly from said diffusion plate to engage sides of a base component upon which said heat generating component is affixed.

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32. The heat diffusing member according to claim 31, further including a pair of tongues extending from ends of each of the lateral plates to form engaging sections.

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33. The heat diffusing member according to claim 31, further including a spring member to urge said heat diffusing member towards said heat generating component.

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34. The heat diffusing member according to claim 31, wherein said heat sink has area dimensions greater than said heat diffusing member, and said heat diffusion member has area dimensions greater than said heat generating component.

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